

Docket No.: 50103-337



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AF/1773

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of

Mariana Munteanu et al.

Serial No. 09/702,667

Filed: November 1, 2000

Confirmation No. 9652

Customer No. 20277

Art Unit: 1773

Examiner: K. Bernatz

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File

FOR: BILAYER MAGNETIC STRUCTURE FOR HIGH DENSITY RECORDING MEDIA

**TRANSMITTAL OF APPEAL BRIEF**

Commissioner for Patents  
Washington, DC 20231

Sir:

Submitted herewith in triplicate is Appellant(s) Appeal Brief in support of the Notice of Appeal filed June 3, 2003. Please charge the Appeal Brief fee of \$320.00 to Deposit Account 500417.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

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Respectfully submitted,

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**APPEAL BRIEF**

Commissioner for Patents  
Washington, DC 20231

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed June 3, 2003.

**I. REAL PARTY IN INTEREST**

The real party in interest is Seagate Technology LLC.

**II. RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related Appeal or Interference.

**III. STATUS OF CLAIMS**

Claims 1 through 9, all pending claims, have been finally rejected. It is from the final if

rejection of claims 1 through 9 that this Appeal is taken.

#### **IV. STATUS OF AMENDMENTS**

No Amendment has been submitted subsequent to the issuance of the most recent Office Action dated March 5, 2003.

#### **V. SUMMARY OF THE INVENTION**

It is extremely difficult to produce a magnetic recording medium with optimum performance of various interrelated but offsetting properties (page 4 of the written description of the specification, lines 1 through 4). For example, in order to improve the signal to noise ratio of a medium (SMNR) and coercivity, the amount of platinum and chromium of the magnetic alloy must be increased, but this detrimentally impacts magnetic saturation (Ms), thereby triggering lower amplitudes and weaker signals (page 4 of the written description of the specification, second full paragraph, page 6 of the written description, lines 25 through 28). Appellants address and solve that problem by providing a strategic combination of first and second magnetic layers, wherein the first magnetic layer is optimized for SMNR and the second magnetic layer, which is provided on the first magnetic layer, is optimized for Ms (page 6 of the written description of the specification, lines 20 through 24 and independent claim 1).

**The notion of forming a magnetic recording medium with one magnetic layer optimized for SMR and a second magnetic layer thereon optimized for Ms is alien to applied prior art.**

## **VI. ISSUES**

### **A. The Rejections:**

1. Claims 1, 7 and 8 under 35 U.S.C. §102 for lack of novelty as evidenced by Ohkijima et al.;
2. Claim 9 was rejected under 35 U.S.C. §103 for obviousness predicated upon Ohkijima et al.;
3. Claims 1, 5 through 7 and 9 were rejected under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. and Zhang et al.;
4. Claim 2 was rejected under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al., Zhang et al., Yoshikawa et al., the acknowledged prior art and Song et al.;
5. Claims 3 and 4 were rejected under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al., Zhang et al., Yoshikawa et al., the acknowledged prior art, Song et al. and Bian et al.;
6. Claim 6 was rejected under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al., Zhang et al. and Ross et al.

### **B. The Issues Which Arise In This Appeal and Require Resolution by the Honorable Board of Patent Appeals and Interferences (the Board) are:**

1. Whether claims 1, 7 and 8 are unpatentable under 35 U.S.C. §102 for lack of novelty as evidenced by Ohkijima et al.;
2. Whether claim 9 is unpatentable under 35 U.S.C. §103 for obviousness predicated

upon Ohkijima et al.;

3. Whether claims 1, 5 through 7 and 9 are unpatentable under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al. and Zhang et al.;

4. Whether claim 2 is unpatentable under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al., Zhang et al., Yoshikawa et al., the acknowledged prior art and Song et al.;

5. Whether claims 3 and 4 are unpatentable under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al., Zhang et al., Yoshikawa et al., the acknowledged prior art, Song et al. and Bian et al.;

6. Whether claim 6 is unpatentable under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al., in view of Miyazaki et al., Zhang et al. and Ross et al.

## **VII. GROUPING OF CLAIMS**

The appealed claims do not stand or fall together as a group. Specifically, as to the rejection predicated upon Ohkijima et al., the appealed claims do stand or fall together as a group with independent claim 1. As to the rejections predicated upon Moroishi et al., the appealed the claims stand or fall together as a group with independent claim 1. In this respect, Appellants note that claim 8 was not rejected predicated upon Moroishi et al. as a primary reference.

## **VIII. THE ARGUMENT**

**1. The rejection of claims 1, 7 and 8 under 35 U.S.C. §102 for lack of novelty as evidenced by Ohkijima et al.**

The invention defined in independent claim 1 is directed to a magnetic recording medium

which comprises two magnetic layers: (1) a first magnetic layer on the underlayer; and (2) a second magnetic layer on the first magnetic layer. In recognition of the difficulty in optimizing both SMNR and Ms in a magnetic recording medium, the first magnetic layer is optimized for SMNR than the second magnetic layer is optimized for Ms. Thus, the first magnetic layer exhibits a higher SMNR than the second magnetic layer, but the second magnetic layer exhibits a higher Ms than the first magnetic layer.

### **The Examiner's Position**

According to the Examiner, Ohkijima et al. disclose a magnetic recording medium with two magnetic layers, interpreting the disclosed **intermediate layer** as a first magnetic layer. Having created a magnetic recording medium with two magnetic layers, the Examiner asserts that the first magnetic layer (the intermediate layer of Ohkijima et al.) exhibits a higher SMNR than the second magnetic layer relying upon the doctrine of inherency. In other words, a layer which need not be magnetic **necessarily** exhibits a better SMNR than the actual intended magnetic layer- talk about straining credulity. Appellants **submit the Examiner is factually and legally wrong.**

### **There is no Inherency**

In order to rely upon the doctrine of inherency, its incumbent upon the Examiner to provide a factual basis upon which to predicate the determinations that an allegedly inherent feature is **necessarily** present in the prior art and that such would have been **recognized** by one having ordinary skill in the art. *Elan Pharmaceuticals Inc. v. Mayo Foundation*, \_\_\_ F.3d \_\_\_, 64 USPQ2d 1292 (Fed. Cir. 2002); *Crown Operations International Ltd. v. Solutia Inc.*, 289

*F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002).* That burden has not been discharged.

The Examiner says that the intermediate layer of Ohkijima et al. is a magnetic, because Ohkijima et al. state that the intermediate layer is "a non-magnetic or feebly magnetic intermediate Co-based alloy" (column 4, lines 38 through 40) which is placed on the underlayer but under the second magnetic layer. Unfortunately, the Examiner stops reading at line 40. Had the Examiner continued to read, he would have found that the "non-magnetic or feebly magnetic intermediate Co-based layer" upon which the Examiner relies, it structured so that:

**...the magnetic influence attributable to the intermediate layer is completely eliminated or markedly minimized**

In other words, the expressed teachings of Ohkijima et al. is to form an intermediate layer, which is non-magnetic or "feebly magnetic", such that its magnetic influence is completely eliminated or markedly minimized. Based upon this clear evulcation of Ohkijima et al., Appellants submit that there is absolutely **no certainty** that the intermediate can be properly characterized as a functioning magnetic layer of a magnetic recording medium. *Finnegan Corp. v. ITC*, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999); *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991); *In re Oelrich*, 666 F.2d 578, 212 USPQ 323 (CCPA 1981).

Further, even if the intermediate layer can be considered a magnetic layer, it does not follow that it would **necessarily exhibit superior SMNR** properties than the real magnetic layer which is positioned thereon. The reason for this is that Ohkijima et al. state that "the magnetic influence attributable to the intermediate layer is completely eliminated or markedly minimized."

Appellants question: **How can such an intermediate layer necessarily exhibit better SMNR properties than the real magnetic layer positioned thereon?**



In the paragraph bridging pages 3 and 4 of the March 5, 2003 Final Office Action, the Examiner states:

In the instant case, Ohkijima et al. disclose a prior art product possessing substantially identical structure to the claimed product (i.e., a dual layered structure....)

The product of Ohkijima et al. is not "substantially identical" to the claimed product. The product of Ohkijima et al. is designed to have a non-magnetic or feebly magnetic layer. The claimed invention is structured with two magnetic layers one optimized for SMNR and the other optimized for Ms. That is a far cry from the feebly magnetic layer, at best, disclosed by Ohkijima et al. There is no sufficient factual basis upon which to invoke the doctrine of inherency.

Based upon the foregoing, Appellant submit that the Examiner's rejection of claims 1, 7 and 8 under 35 U.S.C. §102 for lack of novelty as evidenced by Ohkijima et al. is clearly factually erroneous.

**2. The rejection of claim 9 under 35 U.S.C. §103 for obviousness predicated upon Ohkijima et al.**

As to this rejection, the patentability of claim 9 stands or falls within independent claim 1.

**3. The Rejection of claims 1, 5 through 7 and 9 under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al. and Zhang et al.**

Initially, Appellants would again stress that the invention encompassed by independent claim 1 is a magnetic recording medium wherein comprising two magnetic layers, the first

positioned on the underlayer and optimized for SMNR, while the second is positioned on the first magnetic layer and is optimized for Ms. The notion of optimizing two magnetic layers of a magnetic recording medium separately, one for SMNR and one for Ms, is alien to the applied prior art. As should be apparent, the applied references do not even recognize what Appellants have found by experiment, i.e., that if the platinum content of a cobalt-based magnetic alloy is increased for higher coercivity and the chromium content increased for improved SMNR, the Ms of the alloy is reduced, thereby triggering lower amplitudes and weaker signals (page 6 of the written description of the specification, lines 25 through 28).

### **The Examiner's Position**

The Examiner finds pieces in different references and announces the conclusion of obviousness relying upon generalities. This approach was specifically condemned by the Court of Appeals for the Federal Circuit in *In re Lee*, 237 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). It can not be gainsaid, that Moroishi et al. disclose a magnetic recording medium with more than one magnetic layer. Moroishi et al. seek to optimize coercivity by employing non-magnetic spacer layers between magnetic layers (column 6 of Moroishi et al., lines 28 through 39). The Examiner admits that Moroishi et al. neither disclose nor suggest designing a magnetic recording medium wherein the first magnetic layer has a higher SMNR than the second magnetic layer or, for that matter, a magnetic recording medium wherein the second magnetic layer exhibits a higher Ms than the first magnetic layer. The Examiner then asserts that Zhang et al. disclose the concept of forming a dual magnetic layer structures wherein the first lower magnetic layer has a higher SMNR than the upper second magnetic layer. The Examiner then concludes that one having ordinary skill in the art would have been motivated to modify the magnetic

recording medium of Moroishi et al. by forming the first magnetic layer with an SMNR greater than the second magnetic layer in view of Zhang et al.

**Still not there**, because the resulting magnetic recording medium does not have a second magnetic layer with an higher Ms than the first magnetic layer, the Examiner runs to Miyazaki et al. and then concludes that one having ordinary skill in the art would have been motivated to further modify whatever magnetic recording medium can be said to have been generated by the combined disclosures of Moroishi et al. and Zhang et al. by forming the second magnetic layer with a higher Ms than the first magnetic layer. **All this without a remote suggestion in any of the applied references of the notion of forming a single magnetic recording medium with plural magnetic layers one optimized for SMNR and another optimized for Ms. Indeed, all this without a recognition in the applied prior art that if a magnetic layer is increased for higher coercivity and an improved SMNR, the Ms is reduced--Appellant's contribution** (page 6 of the written description of the specification, lines 25 through 28). *In re Lee, supra*.

### **Appellants' Position**

Initially, Appellants would stress that the applied prior art neither discloses nor suggests the concept of forming a magnetic recording medium having plural magnetic layers, one of which is optimized for SMNR and another optimized for Ms. *In re Lee, supra*. This is because the prior art did not recognize what Appellants found- if coercivity and SMNR are increased, Ms suffers.

The Examiner has merely isolated different aspects of the claimed invention in disparate references and then announced the obviousness conclusion based on generalities. Indeed, the Examiner begins with a reference wherein neither of the magnetic layers is said to be optimized

for SMNR or Ms, but somehow concludes that one having ordinary skill in the art would have been motivated to redesign the magnetic recording medium of Moroishi et al. to arrive at the claimed invention because of an asserted improvement in various magnetic properties. It is difficult to conceive of one having ordinary skill in the art who would not have been motivated to improve magnetic properties. But **where** is the **factual** basis upon which to predicate the conclusion that one having ordinary skill in the art would have been realistically motivated to zero in on the particular magnetic recording medium disclosed by Moroishi et al., optimize one layer for SMNR and then optimize another magnetic layer for Ms? *In re Lee, supra*. Again, the notion of optimizing different magnetic layers of a single magnetic recording medium for SMNR and Ms is alien to the applied prior art.

In *In re Lee, supra*, the Examiner sought to combine two references, each showing a feature of the claimed invention. The Court emphasized that the Examiner must provide a "thorough and searching" factual inquiry based upon objective evidence (*In re Lee, USPQ2d at 1433*). In applying the principles of *In re Lee, supra*, to the facts of this case, Appellants again question: **Where** is the factual basis upon which to predicate the conclusion that one having ordinary skill in the art would have been realistically impelled to provide single a magnetic recording medium with two magnetic layers, one optimized for SMNR and one optimized for Ms?

Appellants would also rely upon *Teleflex Inc. v. Ficosa North America Corp.*, 299 F.3d 1313, 63 USPQ2d 1374,1387 (Fed. Cir. 2002), wherein the Court of Appeals for the Federal Circuit stated:

The showing of a motivation to combine must be clear and particular, and it must be supported by actual evidence.

In the particular structure disclosed by Moroishi et al., optimum magnetic properties are

achieved by employing a **non-magnetic spacer layer**. In the **particular structure disclosed** by Zhang, which is a double layer film, the first magnetic film seeds the microstructure for the upper magnetic film and determines the noise characteristics of the double-layer film. In the particular structure disclosed by Miyazaki et al., at least two ferromagnetic thin films are formed by oblique deposition apparently one directly on the other and the oxygen content varied. Different references--different objectives--different mechanisms. The magnetic recording medium art is not, as the Examiner would have the Honorable Board believe, a LEGGO® game. Again, the recognition that Ms decreases as coercivity and SMNR increase is alien to the applied prior art but found only in Appellants' disclosure. *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985).

#### **Additional Differences between the References**

As previously pointed out, the primary reference to Moroishi et al. requires a non-magnetic spacer layer between the magnetic layers. However, in accordance with Zhang et al., the second magnetic layer is deposited **directly** on the first magnetic layer. The Examiner is quick to point out that Moroishi et al. may have several magnetic layers. Indeed, Appellants would note in accordance with the teachings of Moroishi et al., six or more magnetic layers may be employed if desired (column 8, Moroishi et al., lines 28 to 34). But the Examiner then stops and does identify which of the six possible magnetic layers the Examiner views as the first and which one the Examiner views as the second. According to the claimed invention, the first magnetic layer is on the underlayer. So too it would appear in the structure disclosed by Moroishi et al. Accordingly, the second magnetic layer would be **separated** from the first magnetic layer by a non-magnetic layer.

Further, the structure disclosed by Zhang et al. is a "double-layer" structure, wherein the second layer **must** be deposited on the first layer because the first layer "not only seeds the microstructure for the upper layer film, but also determines the noise characteristics of the double-layer film" (Abstract). The Examiner's superficial treatment of these references fall short of the requisite "thorough and searching" factual inquiry mandated by the Court of the Appeals for the Federal Circuit for attempting to press fit the teachings of Zhang et al. into Moroishi et al. *In re Lee, supra*.

### **Indicium of Nonobviousness**

Appellants would stress that the problem addressed and solved by the claimed invention resides in the decrease in Ms upon increasing the coercivity and SMNR of a magnetic layer. The Examiner has not even attempted to identify wherein that problem is a blip on the radar screens of the applied references. Moreover, that problem is revealed only in Appellants' disclosure. *In re Spinnoble*, 405 F.2d 578, 160 USPQ 237 (CCPA 1969). Accordingly, Appellant submit that the problem addressed and solved by the claimed invention merits consideration as an indicium of **nonobviousness**. *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989); *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975).

### **Conclusion**

The Examiner did not establish a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. §103 for lack of the requisite realistic motivation. Moreover, upon

giving due consideration to the problem addressed and solved by the claimed invention, the conclusion appears inescapable that one having ordinary skill in the art would **not** have found the claimed invention **as a whole** obvious within the meaning of 35 U.S.C. §103. *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975).

Appellants, therefore, submit that the imposed rejection of claims 1 through 7 and 9 under 35 U.S.C. §103 for obviousness predicated upon Moroishi et al. in view of Miyazaki et al. and Zhang et al. is not factually or legally viable.

**Issues (Rejections) 4, 5 and 6 of claims 2, 3, 4 and 6 Under 35 U.S.C. §103 for Obviousness Predicated Upon Moroishi et al. as a Primary Reference with Additional References**

As to these rejections, the patentability of claims 2 through 4 and 6 stands or fall with independent claim 1.

**IX. PRAYER FOR RELIEF**

Based upon the arguments submitted supra, Appellants submits that the Examiner's imposed rejections under 35 U.S.C. §102 and 35 U.S.C. §103 are not factually or legally viable. Appellants, therefore, solicit the Honorable Board to reverse each of the Examiner's rejections under 35 U.S.C. §102 and 35 U.S.C. §103.

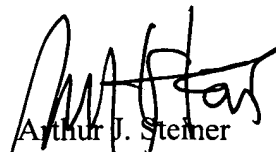
To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to

Serial No.: 09/840,067

such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

A handwritten signature in black ink, appearing to read 'Arthur J. Steiner', is written over the printed name.

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## APPENDIX

1. A magnetic recording medium comprising:

a non-magnetic substrate;

an underlayer on a non-magnetic substrate;

a first magnetic layer on the underlayer; and

a second magnetic layer on the first magnetic layer; wherein:

the first magnetic layer exhibits a higher signal-to-media-noise ratio (SMNR) than the second magnetic layer; and

the second magnetic layer exhibits a higher magnetic saturation ( $M_s$ ) than the first magnetic layer.

2. The magnetic recording medium according to claim 1, wherein:

the first and second magnetic layers each contain cobalt (Co), chromium (Cr) and platinum (Pt);

the first magnetic layer has a higher Cr content than the second magnetic layer; and

the second magnetic layer has a higher Co content than the first magnetic layer.

3. The magnetic recording medium according to claim 2, wherein:

the first magnetic layer contains:

about 20 to about 22 at.% Cr;

about 8 to about 10 at.% Pt;

about 6 to about 8 at.% boron (B); and

the remainder Co; and

the second magnetic layer contains

about 12 to about 16 at.% Cr;

about 6 to about 12 at.% Pt;

about 2 to about 4 at.% tantalum (Ta); and

the remainder Co.

4. The magnetic recording medium according to claim 2, wherein:

the first magnetic layer contains:

about 20 to about 22 at.% Cr;

about 8 to about 10 at.% Pt;

about 6 to about 8 at.% B; and

the remainder Co; and

the second magnetic layer contains:

about 12 to about 16 at.% Cr;

about 6 to about 12 at.% Pt;

about 6 to about 8 at.% B; and

the remainder Co.

5. The magnetic recording medium according to claim 1, wherein the underlayer is a composite comprising two underlayers each containing chromium (Cr).

6. The magnetic recording medium according to claim 5, comprising:  
a first underlayer comprising a Cr alloy on the non-magnetic substrate; and  
a second underlayer comprising a Cr alloy different from the Cr alloy of the first underlayer, on the first underlayer.
7. A magnetic recording medium comprising:  
a non-magnetic substrate; and  
means for achieving a high SMNR, narrow half-amplitude pulse width, high resolution and high magnetic saturation.
8. The magnetic recording medium according to claim 1, wherein the second magnetic layer is directly on the first magnetic layer.
9. The magnetic recording medium according to claim 1, wherein:  
the first magnetic layer has a thickness of about 100Å to about 130Å; and  
the second magnetic layer has a thickness of about 40Å to about 100Å.